

## CLAIMS:

1. A data storage system comprising a set of structures including :

- a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;

5 - a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ;

- and said second structure being separated from said first structure by at least a spacer layer, wherein the non-magnetic material is a metal and the spacer layer comprises a high-resistive metallic material and said spacer layer furthermore causing a mainly  
10 ferromagnetic coupling of said second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure.

2. A system as recited in claim 1 wherein said second structure comprises at least one layer of a magnetic material of a high coercivity.

15 3. A system as recited in claim 1 wherein said second structure comprises at least one layer of an exchange biasing material.

4. A system as recited in claim 1 wherein said second structure comprises a layer  
20 that has a magnetization direction that is substantially anti-parallel with respect to the magnetization direction of said first ferromagnetic layer.

5. A system as recited in claim 1 further comprising a third structure including at least one magnetic layer, said third structure influencing at least one magnetic characteristic  
25 of said first structure, said second structure at least partly compensating for the influencing of said third structure on said first structure.

6. A system as recited in claim 1 wherein said layer of a high-resistive metallic material furthermore is at least partially inducing a crystallographic characteristic on said second and/or said first structure.

7. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is one of the group of Ti, Zr, Hf, V, Nb, and Ta, or any combination thereof .

8. A system as recited in claim 6 wherein said layer of a high-resistive metallic material has a thickness in the range of one atomic layer up to 15 nm.

9. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is one of the group of Mo, Cr, and W or any combination thereof.

10. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is a metallic polymer with a conductivity in the range of the conductivities of the group of Ti, Zr, Hf, V, Nb, Ta, Mo, Cr, and W or any combination thereof.

11. A system as recited in claim 6 wherein said second structure is separated from said first structure by at least said layer of said high-resistive metallic material and an insulating layer abutting said layer of said high-resistive metallic material.

12. A system as recited in claim 1 wherein the set of structures is part of a magnetic memory structure such as a MRAM structure, preferably being integrated on a semiconductor substrate.

13. A sensing system of a magnetic characteristic, said system comprising :  
- a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;  
- a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ; and said second structure being separated from said first structure by at least a spacer layer, wherein the non-magnetic material is a metal and the spacer layer comprises a high-resistive metallic material and said spacer layer furthermore causing a mainly ferromagnetic coupling of said

second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure.

14. A method of fabricating a magnetic system, the method comprising the steps of :

- defining a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic metallic material therebetween, said first structure having at least a magneto resistance effect;

10 - defining a second structure, said second structure including at least one magnetic layer or a set of layers for influencing at least one intrinsic magnetic characteristic of said first structure ; and

15 - defining at least one layer of a high-resistive metallic material in-between said second structure and said first structure, and said layer of a high-resistive metallic material furthermore at least partially inducing a crystallographic characteristic on said second structure.

15. A method of tuning a magneto resistance characteristic of a magnetic system, the system comprising a set of structures including a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic metallic material therebetween, said first structure having at least said magneto resistance characteristic, the method comprising the steps of :

20 - defining a layer of a high-resistive metallic material on said first structure ; and

25 - defining a second structure including at least one magnetic layer on said layer of said high-resistive metallic material, said second structure said second structure including at least one magnetic layer or a set of layers for influencing at least one intrinsic magnetic characteristic of said first structure.

16. A magnetic system such as data storage system or a sensing system of a magnetic characteristic, the system comprising a set of structures including :

30 - a first structure of layers including at least a first ferromagnetic layer structure and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;

- a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ;

- said second structure being separated from said first structure by at least a spacer layer of a high-resistive metallic material and said spacer layer of a high-resistive

5 metallic material furthermore influencing the coupling of said second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure; and wherein

- said first ferromagnetic layer structure and said second structure respectively comprising an even or odd number of non-abutting ferromagnetic layers and an odd or even  
10 number of non-abutting ferromagnetic layers.